2000 ANNUAL REPORT
Restoration of the American Chestnut Tree
Miami University Task Order 009

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Introduction

This report is to summarize the progress of the American chestnut restoration project, specifically the fall of 1999 and through 2000. During this time, seedlings and seeds were directly planted in the fall and in the spring. Prior to planting, the project area was mowed and all existing vegetation was eliminated via the application of Roundup herbicide. Fernald site workers then mulched the entire project area. Plastic mesh deer exclosure fencing was then installed around the perimeter of the plot. The area was hand-weeded several times during the 2000 growing season. Inventory of tree survival and condition was recorded in June of 2000.

Pedigree of Plantings

In an effort to locate enough chestnut seedlings and seed for field planting, a variety of pedigrees of seeds and seedlings were obtained from three sources: the American Chestnut Foundation, the American Chestnut Council, and Oikos Tree Crops.

Chestnut Seedlings (18-24" tall) Planted in the Fall of 2000

Quantity Planted	Species	Source
20	pure American Chestnuts (*Castanea dentata*) from the Ellinghoe line.	American Chestnut Council
28	Douglas/American Chestnut Hybrids* (*Castanea dentata* X *mollissima* ECOS)	Oikos Tree Crops

*The Douglas hybrids are the most widely planted hybrid chestnut and have been recognized by many as blight resistant. Open pollinated American and Manchurian crosses produced the hybrid trees. The trees are precocious and the hardiest of all commercially available hybrids.

Hybrid Chestnut Seed Pedigree and Source

Quantity Planted	Genotype	Source
24	D-150-N	American Chestnut Council
24	F-013-N	American Chestnut Council
30	O-030-N	American Chestnut Council
34	OPCL112	American Chestnut Foundation
34	OPCL 53	American Chestnut Foundation
44	OPCL 149	American Chestnut Foundation

Pure Chestnut Seed Pedigree and Source

Quantity Planted	Species	Source
4	American Chestnut (*Castanea dentata*)	American Chestnut Foundation
4	Chinese Chestnut (*Castanea mollissima*)	American Chestnut Foundation

Planting Time and Methods

Ninety-three hybrid Chestnut seeds and forty-five seedlings were planted in the fall of 1999. After planting, six to eight inches of mulch was used to cover the areas to help prevent freezing; the mulch was removed in the spring. Ninety-seven hybrid Chestnut seeds and four each of pure American (*Castanea dentata*) and pure Chinese (*Castanea mollisima*) seeds were planted in the spring of 2000.

In concordance with the literature, mesh wire was placed around the seeds and trees, extending a few inches below and above the ground in order to deter rodents, such as voles. Though planting in the fall can risk freeze killing of the seeds, no difference in the germination or survival was discerned between the two plantings so the remainder of the report will be concerned with the types themselves, not the time of planting.

Germination and Survival

Due to the tall grass and other herbaceous plants in the plot (ranging up to six feet in height), sixteen percent of seeds and seedlings could not be located (Figure 1). The vegetation cover appeared to reduce damage from browsing, as the deer couldn't easily locate the saplings. We are hopeful that the survival rates reported here will increase when the plot is surveyed in the spring of 2001.

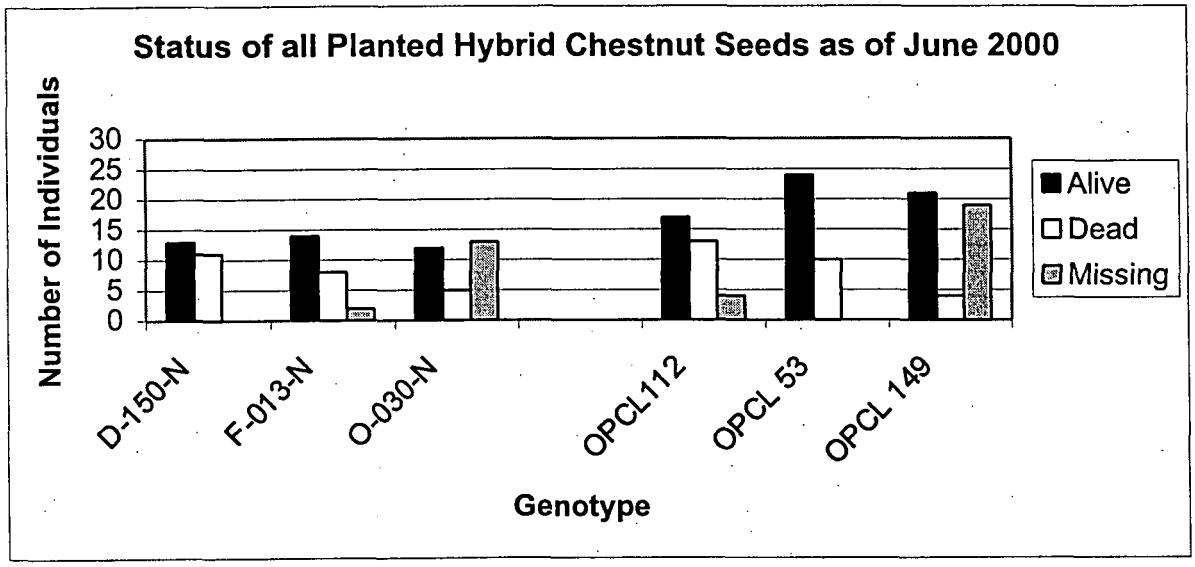

Figure 1

Overall hybrid seed survival (*not including the unlocated plantings*) was 53%. The number of germinated and surviving hybrid individuals of the six genotypes ranged from a low of 40% for 0-030-N to 71% for OPCL 53 (Figure 2).

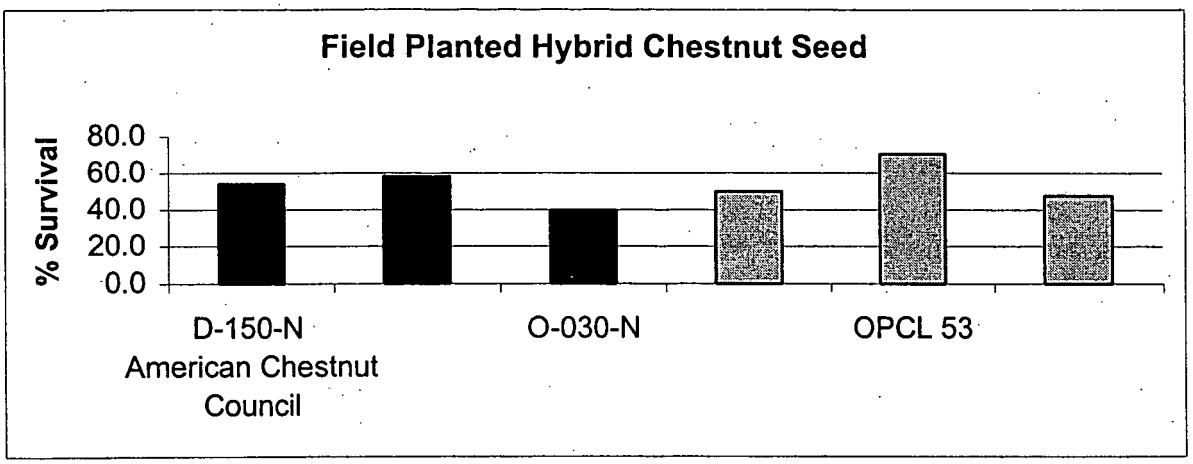

Figure 2

Percent survival of hybrid chestnut seeds planted in the fall of 2000 and Spring of 2001.

In addition to planting seeds, forty-eight bare-root seedlings were planted in the fall of 2000 to help ensure the establishment of Chestnut at Fernald. During the June 2000 census, a number of seedlings were missing –although their flags and in come cases their aluminum tags were found.
It is likely that herbivores are responsible for the "missing" seedlings, since the area was carefully searched for several hours in an attempt to locate all of the young trees.

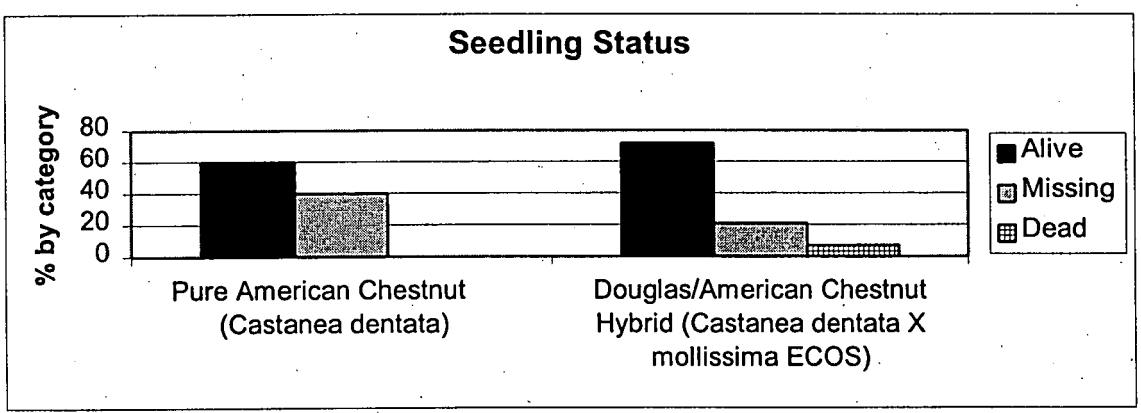

Figure 3

Survival and status of 18-24" bare-root seedlings planted in the fall of 2000. The American Chestnut Council provided the pure American seedlings, and the Douglas/American hybrids were purchased from OIKOS Tree Crops.

Although a fence was established around the plot, it did not prove effective in keeping deer out, and browsing was prevalent among the germinated nuts and the seedlings. Twenty percent of the trees recorded as "alive" showed heavy deer browsing, if such browsing continues it will severely decrease growth, overall biomass, and the survivability of the seedlings. Also, browsing can lead to the development of compact seedlings, with unequal growth, large branches and small leaf biomass.

Recommendations and 2001 Plans

In the spring of 2001, seedlings will be fertilized and maintained as needed. In order to control the competing weeds, individual trees will be weeded by hand, Roundup will be applied around the perimeter of each tree, and the use of a fabric weed control barrier may also be utilized. As described above, the herbaceous vegetation in the Chestnut plot is dense and the tree seedlings are currently competing for light, nutrients, and water. As the seedlings grow they will eventually out compete the weeds for light, and the shade provided by the chestnuts will eventually help to suppress the sun-loving weeds and grasses. But before one can suppress the vegetation, leaving the seedlings more vulnerable to deer browsing, deer proof fencing is required. We have observed the present fencing to be folded over or entirely detached from the poles on several occasions. A 10-foot tall welded wire deer exclosure fence will be installed in the spring of 2001. This fence will provide a more effective deterrent to deer browsing on the chestnut seedlings.

The above issues and basis for previous recommendations have been thoroughly addressed in a paper previously submitted to Fernald site: Implications of Reforestation: Controlling Mammalian Browsing and Competing Vegetation. (Revised Literature Review, 1999).